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10/697,401	10/29/2003	Tony J. Keeton	ASMEX.419A	7477

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EXAMINER
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FIORITO, JAMES

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/697,401

Applicant(s)

KEETON ET AL.

Examiner

James A. Fiorito

Art Unit

1763

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 23-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 27-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-29 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/17/05.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-22, 27-29 drawn to an apparatus, classified in class 156, subclass 345.51.
- II. Claims 23-26, drawn to a method, classified in class 29, subclass 25.01.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the method of manufacturing an apparatus requires: forming a substrate holder out of graphite, a first annular groove in the substrate holder, a second annular groove in the substrate holder, and coating the substrate holder with SiC, which are absent from the apparatus described in Claim 1.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

This application contains claims directed to the following patentably distinct species of the claimed invention:

Species 1 – Embodiment 1, Fig. 3A; and

Species 2 – Embodiment 2, Fig. 5A.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, Claim 1 is generic to species 1.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Sonny Gill on 9/23/2005 a provisional election was made with traverse to prosecute the invention of Species 2, claims 1-22

and 27-29. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-22, and 27-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Goodman (US 2003/0198910).

***With respect to Claim 1:*** Goodman discloses an apparatus for processing a semiconductor substrate (Fig. 6b Item 16), comprising a substrate holder (Fig. 6b Item 200) comprising a support element configured to support a substrate of a particular size in a support plane defined by the support element (Fig. 6b Item 220), wherein the support element comprises an annular veined ring (Fig. 6b Item 222) supporting an

outer edge of the substrate when the substrate is supported on the support element (Fig 6b Item 220).

***With respect to Claim 2:*** Goodman discloses an apparatus in accordance with Claim 1, wherein the support element comprises at least 300 veins. Given the tops of the protrusions are square (0.20mm by 0.20mm) and the flat bottom portions of the grooves are 0.56mm in width distributed over the surface of the support element accommodating a 300mm wafer (Fig. 4 Item 222, Page 3 Column 2 lines 66-67, Page 4 Column 1 Lines 1-2).

***With respect to Claim 3:*** Goodman discloses an apparatus in accordance with Claim 1, further comprising a first annular groove on the substrate holder (Fig. 1a Item G), the first annular groove being positioned radially inward from the support element (Figure 1a Item G).

***With respect to Claim 4:*** Goodman discloses an apparatus in accordance with Claim 3, wherein the first annular groove has a generally uniform annular thickness (Fig. 1a Item G).

***With respect to Claim 5:*** Goodman discloses an apparatus in accordance with Claim 3, wherein the substrate holder further comprises a substrate pocket (Fig. 4 Item 200) and the first annular groove is formed such that the first annular groove is lower than a surface of the substrate pocket (Fig. 4 Item 222).

***With respect to Claim 6:*** Goodman discloses an apparatus in accordance with Claim 3, further comprising a second annular groove on the substrate holder, the second annular groove being positioned radially outward from the support element (Fig. 1a Item 7).

***With respect to Claim 7:*** Goodman discloses an apparatus in accordance with Claim 6, wherein a vertical depth of the first annular groove is greater than a vertical depth of the second annular groove (Fig. 4 Item 222).

***With respect to Claim 8:*** Goodman discloses an apparatus in accordance with Claim 5, further comprising an annular ring raised above the substrate pocket and positioned radially inward of the support element (Fig. 4 Item 220).

***With respect to Claim 9:*** Goodman discloses an apparatus in accordance with Claim 1, wherein the substrate holder is configured to be supported by a spider structure comprising a vertical shaft and at least three substrate holder supporters extending radially outward and upward from the shaft, the substrate holder supporters configured to support the bottom surface of the substrate holder (Fig. 2 Item 24).

***With respect to Claim 10:*** Goodman discloses an apparatus in accordance with Claim 9, wherein the bottom surface of the substrate holder includes a recess configured to receive upper ends of the substrate holder supporters of the spider structure (Fig. 3b Item 214).

***With respect to Claim 11:*** Goodman discloses an apparatus in accordance with Claim 9, wherein the bottom surface of the substrate holder includes a circular groove centered about a central vertical axis of the substrate holder (Fig. 3b Item 214), the circular groove configured to receive upper ends of the substrate holder supporters of the spider structure (Fig. 3b Item 214), the circular groove of the bottom surface being interrupted in one location (Fig. 3b Item 216).

***With respect to Claim 12:*** Goodman discloses an apparatus for processing a substrate, comprising: a reaction chamber (Fig. 2 Item 12); a plurality of radiant heating elements configured to heat the reaction chamber (Fig. 2 Item 14); and a substrate holder in the reaction chamber (Fig. 2 Item 20), the substrate holder having a plurality of support elements configured to support a substrate of a particular size within a support plane defined by the plurality of support elements (Fig. 6b Item 220), wherein the support elements comprise a plurality of spaced veins configured in an annular ring to support an outer edge of the substrate (Fig. 6b Item 222).

***With respect to Claim 13:*** Goodman discloses an apparatus in accordance with Claim 12, wherein the substrate holder further comprises: a substrate pocket (Fig. 5 Item 229); and an annular groove formed in the substrate pocket and configured to surround an outer edge of the substrate (Fig. 4 Item 204) when the substrate is supported on the plurality support elements (Fig. 6b Item 220).



***With respect to Claim 14:*** Goodman discloses an apparatus in accordance with Claim 12, wherein the support plane is formed by top surfaces of the plurality of spaced veins (Fig. 6b Item 222).

***With respect to Claim 15:*** Goodman discloses an apparatus in accordance with Claim 13, further comprising an annular recess in the substrate pocket, the annular recess positioned radially inward of the support elements (Fig. 5 Item 222).

***With respect to Claim 16:*** Goodman discloses an apparatus in accordance with Claim 12, further comprising a support structure configured to support the substrate holder, the support structure comprising a vertical shaft and a plurality of support arms extending generally radially outward and upward from the shaft, the support arms having upper ends configured to support the substrate holder (Fig. 2 Item 24).

***With respect to Claim 17:*** Goodman discloses an apparatus in accordance with Claim 13, further comprising an annular ring on the substrate holder, the annular ring being positioned radially inward of the support elements and having a raised surface higher than a surface of the substrate pocket but no higher than the support plane (Fig. 4 Item 220).

***With respect to Claim 18:*** Goodman discloses an apparatus for processing a substrate, comprising a susceptor having a support surface sized to support a substrate of a particular size in a support plane, wherein the support plane is formed by top surfaces of a plurality of veins (Fig. 6b Item 220).

***With respect to Claim 19:*** Goodman discloses an apparatus in accordance with Claim 18, wherein the plurality of veins are formed in an annular ring to support an outer edge of the substrate (Fig 6b Item 222).

***With respect to Claim 20:*** Goodman discloses an apparatus in accordance with Claim 19, further comprising a plurality of annular recesses in the susceptor, wherein a first of the plurality of recesses is positioned radially outward of the plurality of veins (Fig. 4 Item 204) and a second of the plurality of recesses is positioned radially inward of the plurality of veins (Fig. 4 Item 228).

***With respect to Claim 21:*** Goodman discloses an apparatus in accordance with Claim 18, further comprising an annular ring on the susceptor, wherein the annular ring being positioned radially inward of the plurality of veins and having a raised surface no higher than the support plane (Fig. 4 Item 220).

***With respect to Claim 22:*** Goodman discloses an apparatus in accordance with Claim 20, further comprising an annular ring on the susceptor the annular ring being positioned radially inward of the plurality of veins and having a raised surface no higher than the support plane (Fig. 4 Item 228).

***With respect to Claim 27:*** Goodman discloses an apparatus for processing a semiconductor substrate, comprising a substrate holder having an annular ring of veins configured to support a substrate of a particular size (Fig. 6b Item 222), wherein each vein is generally parallel to two adjacent veins, substantially all of the veins being angled with respect to a center of a ring (Fig. 6b Item 222).

**With respect to Claim 28:** Goodman discloses an apparatus in accordance with Claim 27, wherein the ring of veins is configured to support an outer edge portion of the substrate (Fig. 6B Item 220).

Claims 27-28 rejected under 35 U.S.C. 102(b) as being anticipated by Halpin (US 2001/0054390).

**With respect to Claim 27:** Halpin discloses an apparatus for processing a semiconductor substrate (Fig. 1 Item 20), comprising a substrate holder having an annular ring of veins configured to support a substrate of a particular size (Fig. 23a Item 615), wherein each vein is generally parallel to two adjacent veins (Fig. 23a Item 615b), substantially all of the veins being angled with respect to a center of the ring (Fig. 23a, 615b).

**With respect to Claim 28:** Halpin discloses an apparatus in accordance with Claim 27 wherein the ring of veins is configured to support an outer edge portion of the substrate (Fig. 23a Item 615).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Halpin (US 2001/0054390) in view of Yudovsky (US 5,985,033).

***With respect to Claim 29:*** Halpin discloses an apparatus in accordance with Claim 27 (Fig. 23b Item 615), however does not disclose expressly at least some of the veins are curved.

The Yudovsky patent discloses a veined ring wherein at least some of the veins are curved (Fig. 6 Item 10, Column 7 Lines 46-50). Halpin and Yudovsky are analogous art because they are from the same field of endeavor, namely substrate holders.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to form Halpin's veined ring further including at least some of the veins are curved in view of the teaching of Yudovsky. The suggestion or motivation for doing so would have been to provide a more laminar flow because the change in direction of flow is less abrupt as taught by Yudovsky (Column 7 Lines 49-50).

Therefore, it would have been obvious to combine Halpin with Yudovsky for the benefit of a veined ring wherein at least some of the veins are curved to obtain the invention specified in Claim 29.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Keeton publication number 2003/0140850 teaches an annular veined ring support element.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Fiorito whose telephone number is (571)272-7426. The examiner can normally be reached on Standard.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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